

found this species in only three of the 20 locations, all less than 1 km from the type locality. Altogether, including the type locality, only 17 individuals were seen in the wild, with four, three, five, and five individuals, respectively, in each location. The rarity of this species may be the result of the destruction of its habitat, as some of the broad-leaved evergreen forests have been destroyed or replaced by planted forests or economic forests, and, to a lesser degree, by its own viability. It is therefore considered to be facing a very high risk of extinction in the wild.

Phenology. The new species was observed in flower from August to October in the wild.

Relationships. The new species is somewhat similar to *Chroniochilus virescens* (Ridl.) Holttum, from which it differs by having larger leaves (7–10 × 1.4–2.1 cm vs. 3–4[–7] × ca. 1 cm in *C. virescens*), a longer inflorescence (8.5–18 cm vs. 1.5–3 cm), broad-ovate bracts 1–1.5 mm long (vs. ovate-lanceolate bracts to 2–3 mm long), a cordate-conical lip

constricted in the upper part (vs. lip conical), and longer side-lobes (3.5–4.5 mm vs. 1.5–2 mm). In addition, *C. sinicus* also superficially resembles *Parapteroceras elobe* (Seidenf.) Aver.; the new species differs by its spurlike lip that is solid and lacks a midlobe, the inflorescence that is much longer than the leaves, and the pollinarium with a much narrower stipe and viscidium.

Paratype. CHINA. **Yunnan:** Malipo Co., Chuantou, 21 Aug. 2009 (fl. in cult. at NOCC), Z. J. Liu 4466 (PE).

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New Species of *Aidia* and *Polysphaeria* (Rubiaceae) from East Africa

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ABSTRACT. The two species of *Aidia* Lour. (Rubiaceae, Gardenieae) newly described here bring this genus to three species in Tanzania and Kenya. *Aidia abeidii* S. E. Dawson & Gereau, from evergreen coastal forests of eastern Tanzania and Kenya, corresponds to an unnamed species mentioned in the Rubiaceae treatment for the *Flora of Tropical East Africa*. *Aidia crassifolia* S. E. Dawson & Gereau, from evergreen forests of northeastern and east-central Tanzania, is a larger tree or shrub with much larger inflorescences than the other two species of *Aidia* in tropical East Africa. The new species of *Polysphaeria* Hook. f. (Rubiaceae, Octotropideae), *P. ntemii* S. E. Dawson & Gereau, from evergreen forests of the East Usambara lowlands in Tanzania, corresponds to *Polysphaeria* sp. B of the *Flora of Tropical East Africa*.

Key words: *Aidia*, coastal forests, conservation, East Africa, Eastern Arc Mountains, Gardenieae, IUCN Red List, Kenya, Octotropideae, *Polysphaeria*, Rubiaceae, Tanzania, Uluguru Mountains, Usambara Mountains.

The Eastern Arc Mountains and coastal forests of Tanzania and Kenya are well known to support a high diversity of both plants and animals with extremely high concentrations of rare and endemic species (Myers et al., 2000; Critical Ecosystem Partnership Fund, 2003; Burgess et al., 2007; Hall et al., 2009). Recent and ongoing botanical exploration in this area continues to add to this number (e.g., Gereau & Bodine, 2005; Lantz & Gereau, 2005; Couvreur et al., 2006). Continuing this trend, three new species in two genera of Rubiaceae are described below.

AIDIA

Aidia Lour. (Rubiaceae, Gardenieae; Robbrecht, 1993) is a genus of about 50 (Ridsdale, 1996) to 53 species of shrubs and trees of Africa, Asia, and the western Pacific region (Govaerts et al., 2009). In contrast to the general characterization of Rubiaceae, many species of the tribe Gardenieae, including

species of *Aidia*, have resinous exudates. *Aidia* is distinguished within the Gardenieae by triangular stipules that are either shortly fused around the stem or free and interpetiolar; hermaphroditic 4- or 5-merous flowers; corolla lobes convolute in bud and overlapping to the left, 2(rarely 3)-locular ovaries with numerous ovules on peltate; axile placentas; baccate fruits; and a distinctive inflorescence arrangement. The inflorescences are congested to laxly cymose and borne on one side of the stem at or just above every second or third node in a pseudoaxillary or supraaxillary position. The inflorescence is sometimes positioned opposite a developed leaf but with the subtending leaf reduced or apparently lacking, or sometimes the node bearing the inflorescence is apparently leafless, with the leaf opposite the inflorescence reduced to an inconspicuous scale. The flowers often have secondary pollen presentation, with the non-receptive outer surface of the stigma forming an oblongoid to clavate, ridged pollen presenter on which the pollen of the same flower is first deposited, and then dispersed by pollinators from that position.

Verdcourt (1988a) reported one species and variety of *Aidia* from Tanzania and Kenya, *A. micrantha* (K. Schum.) Bullock ex F. White var. *msonju* (K. Krause) E. M. A. Petit, and suggested that another, possibly separate species, which he called *Aidia* sp., might also be found there based on very imperfect material. Recent botanical exploration in the region has now documented this second species as well as the other species newly described below. Both new species belong to *Aidia* sect. *Aidia*, as circumscribed by Ridsdale (1996), by the character combination of leaf-opposed inflorescences, lanceolate corolla lobes, linear anthers, and oblongoid (not clavate) pollen presenters.

KEY TO THE SPECIES OF *AIDIA* IN EAST AFRICA (KENYA, TANZANIA, UGANDA)

- 1a. Tree or shrub 12–25 m tall; leaf blade moderately to somewhat thickly coriaceous; leaf subtending inflorescence reduced but not scalelike, ca. 8 ×

- 3.4 cm; inflorescence 75- to 100-flowered, 4.5–6.7 × 4.8–8.2 cm *A. crassifolia*
- 1b. Tree or shrub to 12 m tall; leaf blade thinly coriaceous; leaf subtending inflorescence reduced and scalelike, 5.8–15 × ca. 0.5 mm; inflorescence 7- to 35-flowered, 1.5–4 × 3.2–5.5 cm.
- 2a. Leaves elliptic to elliptic-lanceolate, (3–)7–13 × 1–4.2 cm, with 5 or 6 lateral veins; inflorescence lax on peduncle 6–10 mm long; pedicels 0.5–3.8 mm long; flower 15.7–16 mm long; apex of bud rounded, outer surface glabrous; calyx limb 2–2.5 mm long; ovary with 12 to 22 ovules. Eastern Kenya and Tanzania, 40–360 m *A. abeidii*
- 2b. Leaves elliptic, 10–16(–18) × 3–7 cm, with 7 or 8 lateral veins; inflorescence compact, sessile or on peduncle to 4 mm long; pedicels 3–9(–16) mm long; flower 15–23 mm long; apex of bud pointed, outer surface with fine white pubescence or glabrous; calyx limb 3–4 mm long; ovary with 50 to 100 ovules. Uganda, Tanzania, east-central and southern Africa, 1050–1800 m *A. micrantha* var. *msonju*

1. *Aidia abeidii* S. E. Dawson & Gereau, sp. nov.
TYPE: Tanzania. Pwani Region: Bagamoyo Distr., Zaraninge Forest, Gongo Village, near WWF office, 06°11'S, 38°36'E, 260 m, 1 July 1998 (fl.), *Y. S. Abeid 264* (holotype, K; isotypes, BR, M, MO, NHT, UPS). Figure 1.

Haec species quoad altitudinem 12 m non excedentem et inflorescentiam folio ad squamam reducto subtentam *Aidiae micranthae* (K. Schum.) Bullock ex F. White similis, sed ab ea foliorum venis secundariis 5 vel 6, inflorescentia laxa pedunculo longiore insidente, pedicellis saepe brevioribus, limbo calycino brevioribus atque ovario pauciovulato distinguitur.

Tree or somewhat scandent shrub (3–)8–12 m tall, to 30 cm DBH; bark gray, darker in patches; branches terete, 4.5–5 mm diam., glabrous; young shoots somewhat shining, smooth, turning gray-brown with flaky bark when mature; internodes evenly spaced between flowering and nonflowering nodes, 1.4–2.4 cm. Stipules clasping stem but pairs barely connate at base, triangular to broadly triangular, 3–4 × ca. 2.3 mm, articulated when mature, falling to leave a pale corky ring with thick colleters and pale trichomes at base, apex long-aristate, 1.5–3.8 mm, margins chartaceous, ciliate; petiole 2–6 mm, laterally impressed and channeled with rounded margin, pink when fresh, drying brown to dark brown, glabrous; leaf lamina elliptic to elliptic-lanceolate, (3–)7–13 × 1–4.2 cm, thinly coriaceous, drying bronze-brown to olive-green, paler abaxially, shiny adaxially when mature, glabrous, apex acuminate with short sharp apical point ca. 0.6 mm, base narrowly cuneate and sometimes slightly asymmetric; midrib depressed adaxially, sometimes pinkish; venation camptodromous to weakly brochidodromous with secondary

veins 5 or 6 pairs, ascending at angle of 45°–50°; tertiary and higher-order veins visible and raised abaxially; domatia in axils of secondary and tertiary veins, ovate to elliptic, to 3 mm long, as raised bumps adaxially, as foveolae abaxially, pubescent at pit entrance with straight pale trichomes 0.2–0.4 mm, with white fibrous matter inside. Inflorescence lateral at nodes with subulate subtending scalelike leaf 5.8–8 × ca. 0.5 mm and opposing full-sized leaf, lax, 7- to 35-flowered, 2.4–4 × 3.2–5.5 cm; peduncle 6–10 mm, minutely puberulous with trichomes sometimes arranged in lines; primary inflorescence axes 3 to 6, cincinnoid; bracts and bracteoles in pairs at each node but subopposite at first node, articulated when mature, falling to leave a pale ring with many thick colleters and straight pale trichomes; bracts rounded, 1.7–1.8 × ca. 2 mm, chartaceous, drying pale brown, ciliate, with shortly cuspidate or aristate apical lobe ca. 0.7 mm; bracteoles similar to bracts, ca. 1 × 2 mm with apical lobe 0.3–0.4 mm; pedicels swollen and puberulous just below flower, 0.5–3.8 mm. Flower 15.7–16 mm; hypanthium turbinate, 3.7–4 mm, drying dark brown, glabrous; calyx limb funnel-shaped, 2–2.5 × ca. 3 mm, lobes rounded, ca. 0.5 mm, apex short-mucronulate, 0.2–0.4 mm, margins pale, chartaceous, ciliate; corolla rounded at apex in bud, ca. 14 mm at maturity, salverform, white, tube funnel-shaped, ca. 5 mm, ca. 3 mm diam. at widest point, glabrous outside, throat with 1.2–1.5 mm wide band of crisped trichomes 0.7–1.3 mm long at apex and narrow broken ring of straight trichomes 0.6–1.7 mm long just above at bases of lobes, lobes 6.3–6.8 × ca. 2.7 mm, glabrous, margins revolute, ciliate only in very young bud; anthers basifixed on curling filaments ca. 2.5 mm attached at base of corolla lobes, thecae ca. 5.7 × 0.6 mm, sterile apex 0.20–0.25 mm; ovary 2-locular, placentas attached to upper half of septum, ovules 12 to 22, embedded in fleshy placental matrix; disk depressed-cupular; style ca. 12 mm, pollen presenter ca. 6 × 1–1.2 mm. Fruit subglobose, wrinkled when dry, 5–6 × ca. 8.5 mm; calyx limb persistent; seeds 12 to 14, disk-shaped, ca. 2.3 mm diam., brown, finely striate.

Distribution and habitat. *Aidia abeidii* is known from eastern Tanzania and eastern Kenya in evergreen lowland dry to moist forest and grassland patches, at 40–360 m elevation.

Phenology. *Aidia abeidii* was observed in flower from April to July and October to December, with fruiting observed in April and September.

IUCN Red List category. With post facto georeferencing of historic specimens (*Peter 56092*, *56098*, *56165*; *Procter 2813*) and GIS mapping of

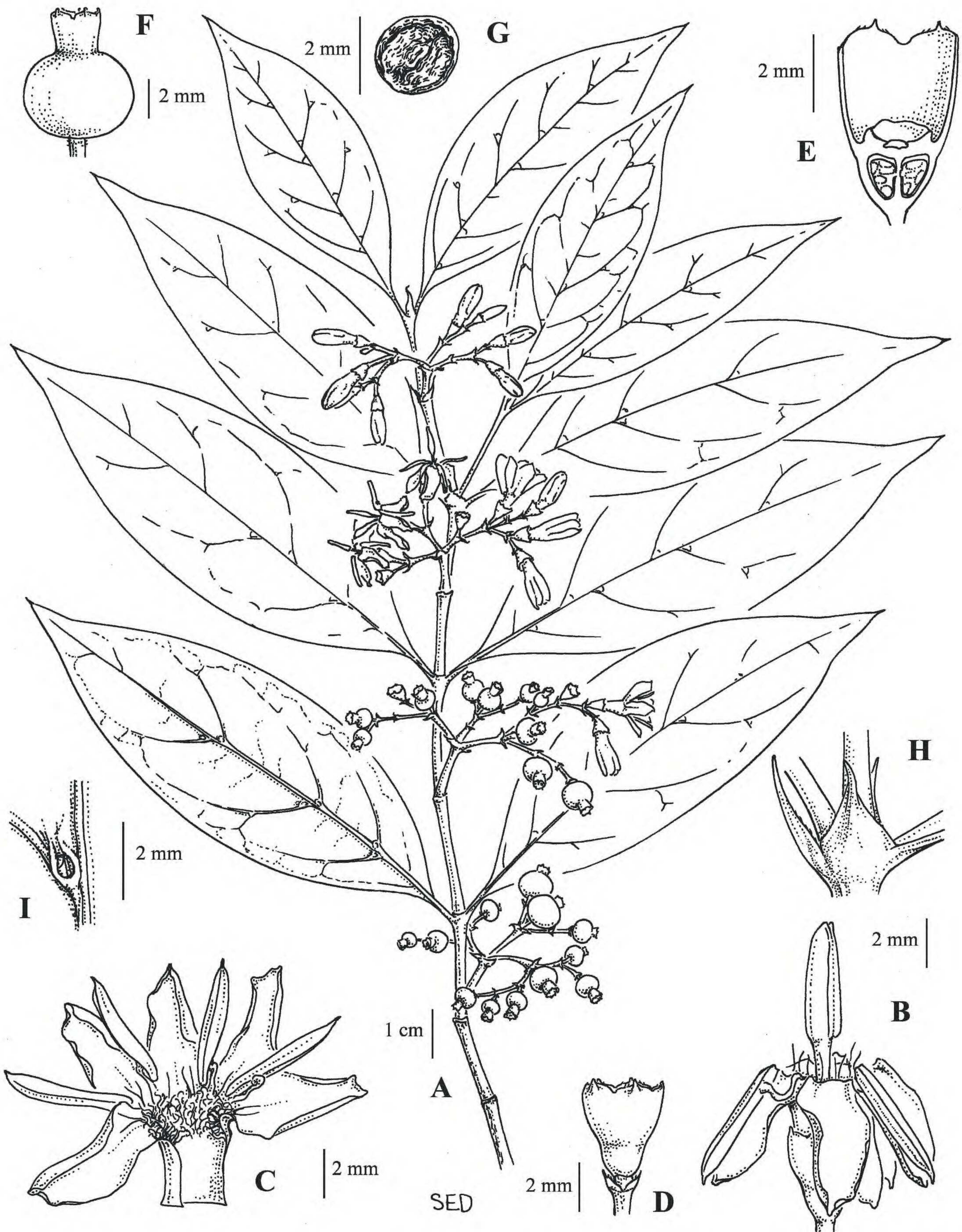


Figure 1. *Aidia abeiddii* S. E. Dawson & Gereau. —A. Flowering and fruiting branch. —B. Flower. —C. Open flower. —D. Calyx. —E. Ovary, longitudinal section. —F. Fruit. —G. Seed. —H. Stipule. —I. Domatium in secondary vein axil on abaxial leaf surface. A–F, H, I from *W. R. Q. Luke 8317* (K); G from *A. Peter 56165* (K).

specimen localities (see specimen citations and distribution map at <www.tropicos.org/name/50322847>), we calculate an extent of occurrence (EOO) of almost 6900 km² and an area of occupancy (AOO) of just under 70 km² using a cell size of 3.16 km. Using

IUCN Red List Categories and Criteria Version 3.1 (IUCN, 2001), with an EOO of < 20,000 km², an AOO of < 2000 km², not more than 10 locations, and the continuing decline in extent and quality of coastal forest habitats due to land clearing and forest

conversion to agriculture throughout the region, we assign this species the IUCN Red List Category of Vulnerable, VU B1ab(iii)+2ab(iii).

Discussion. This new species corresponds to "*Aidia* sp. (aff. *gardneri* (Thwaites) Tirv.)" of Iversen (1991: 204) and "*Aidia* sp." of Verdcourt (1988a: 489), who distinguished the new species from *A. micrantha* by the leaves turning brown on drying, the laxer inflorescence, and the smaller calyx limb, and also suggested an apparent affinity with *A. gardneri* (Thwaites) Tirveng. The specific epithet commemorates the collector of the type, Yahya Shabani Abeid, who was employed at the time by the World Wildlife Fund Coastal Forest Programme. It can be distinguished from the other species of *Aidia* in East Africa by the characters indicated in the key.

Paratypes. KENYA. **Coast Province:** Kwale Distr., Gongoni, 04°24'S, 39°28'E, 40 m, 21 Oct. 1991 (fl. bud), *W. R. Q. Luke 2948* (EA, K, MO, US); Shimba Hills, Mwele Forest, 04°16'S, 39°22' E, 360 m, 1 Apr. 2002 (fl., fr.), *W. R. Q. Luke 8317* (BR, EA, K, MO, NHT, UPS, US, Ukunda). TANZANIA. **Tanga Region:** Muheza Distr., by R. Sigi below Longuza [Longusa], 300 m, 18 Nov. 1917 (fl. bud), *A. Peter 56092* (K, MO); near Kwamtili, 5 Dec. 1917 (fl. bud), *A. Peter 56098* (K); 1 Sep. 1918 (fr.), *A. Peter 56165* (K). **Pwani Region:** Bagamoyo Distr., Zaraninge Forest, dry evergreen coastal forest on Kiono Plateau, 06°09'S, 38°36'E, 300 m, 25 Feb. 1990–18 Mar. 1994 (fr.), *Frontier-Tanzania 909* (BR, K, M, MO, RAB, UPS); Zaraninge Plateau, Dec. 1964 (fl. bud), *J. Procter 2813* (EA, K).

2. *Aidia crassifolia* S. E. Dawson & Gereau, sp. nov.

TYPE: Tanzania. Tanga Region: Korogwe Distr., forest patch on roadside along rd. to Makweli village, W of tea factory, 05°03'53"S, 38°25'38"E, 1000 m, 22 Feb. 2000 (fl., fr.), *M. A. Mwangoka & E. Nyenga 1196* (holotype, K; isotypes, BR, M, MO, NHT, UPS). Figure 2.

Haec species a congeneris Africae orientalis statura altiore, lamina foliari crassiore atque inflorescentia multiflora longiore folio reducto non squamiformi subtenta distinguitur.

Tree or shrub 12–25 m tall, ca. 25 cm DBH; red resin or sap visible in some organs as shiny exudate on cut surfaces; branches terete, 3–6 mm diam., glabrous; young shoots drying black, smooth, turning brown with rough bark when mature; internodes evenly spaced between flowering and nonflowering nodes, 3–5 cm. Stipules clasping stem, narrowly triangular-lanceolate, ca. 11.5 × 3–6 mm, articulated when mature, falling to leave a pale corky ring with several thick bronze-brown colleters and pale trichomes at base, apex long-attenuate, ca. 5 mm, drying black-brown, ciliate; petiole 7–20 mm, laterally impressed and channeled, drying black to dark brown, glabrous; leaf lamina obovate, 8–18.5 × 3.4–8.1 cm,

moderately to somewhat thickly coriaceous, drying bronze-brown when mature, paler abaxially, black when young, glabrous except at pale puberulous apex, apex long-acuminate to cuspidate with acumen 1.2–1.3 mm in young leaves, base narrowly cuneate to attenuate, slightly asymmetric; midrib depressed adaxially; venation weakly to strongly brochidodromous with secondary veins 6 to 8 pairs, ascending at angle of ca. 35° in lower and middle portion of lamina, ca. 55° near apex, joining to form strong submarginal vein 3–4 mm from margin, particularly well developed in mature leaves; tertiary and higher-order veins visible and raised abaxially; domatia in axils of secondary and tertiary veins, transversely elliptic to asymmetrically ovate, 0.5–1.5 × 0.8–1 mm, as raised bumps adaxially, as foveolae abaxially, usually pubescent at pit entrance with 1 to 25 straight pale trichomes 0.25–0.40 mm. Inflorescence observed only when very young and entirely enclosed in bracts and when old in transition to infructescence, lateral 1–1.5 mm above nodes with reduced subtending leaf ca. 8 × 3.4 cm and opposing full-sized leaf, moderately dense, 75- to 100-flowered, 4.5–6.7 × 4.8–8.2 cm; peduncle 13–15 mm, puberulous in young fruit, woody with puberulous-scurfy surface in mature fruit; primary inflorescence axes 3, cincinnoid, flattened and pushed up to form ridges and sometimes with red resin or sap visible at nodes of secondary branches; bracts and bracteoles in pairs, opposite to subopposite at each node, articulated when mature, falling to leave a ring with few thick colleters and pale trichomes; bracts triangular-acuminate, 2.5–3 mm, puberulous outside, glabrous and shiny inside when young, with aristate apical lobe ca. 0.5 mm; bracteoles similar to bracts, with thick brown colleters and pale trichomes on lower margin; pedicels ca. 5 mm below maturing fruit, ca. 3 mm from last bracteole to young fruit, pubescent. Flower with hypanthium crateriform, ca. 6 mm, puberulous; calyx limb tubular to funnel-shaped, ca. 4.2 × 3.6 mm, subcoriaceous, drying bronze-brown, puberulous, lobes 5 or 6, triangular, keeled, widening broadly at base, ca. 1.1 mm, margins reflexed, scarious, pale, sometimes with small narrowly triangular appendages between lobes; corolla ca. 17 mm, salverform, white, tube funnel-shaped, ca. 5.5 mm, ca. 2.2 mm diam. at widest point, glabrous outside, throat with ca. 2.5 mm wide band of pale trichomes 0.3–0.5 mm at apex, lobes 7.8–8 × ca. 2 mm, ciliate; anthers dorsifixed on straight filaments ca. 0.7 mm attached at base of corolla lobes, thecae ca. 7.5 × 0.5–0.7 mm, sterile apex ca. 0.5 mm, sterile tails ca. 0.25 mm; ovary thick-walled, 2-locular with slight false septum in upper part partially dividing ovary into 4 pseudolocules, placentas attached to upper half of septum, ovules ca. 60, embedded in



Figure 2. *Aidia crassifolia* S. E. Dawson & Gereau. —A. Leafy branch. —B. Fruiting shoot. —C. Flower. —D. Open flower. —E. Back of anther. —F. Ovary and calyx, longitudinal section. —G. Cross section of upper ovary. —H. Fruit. —I. Seed. —J. Stipule. —K. Domatium in secondary vein axil on abaxial leaf surface. A, H–J from C. J. Kayombo & M. A. Mwangoka 1456 (K); B–G from M. A. Mwangoka & E. Nyenga 1196 (K); K from E. B. Mhoro UMBCP 374 (K).

fleshy placental matrix; disk domed; style ca. 17.5 mm, pollen presenter ca. 11 mm, slightly bifid at apex. Fruit globose-obovoid, 7–7.5 × 7–7.5 mm, drying black; calyx limb deciduous leaving pale corky scar; seeds angular, ca. 1.5 × 1.2 mm, golden brown when dry, finely striate.

Distribution and habitat. *Aidia crassifolia* is known from eastern Tanzania in evergreen lowland moist forest, at 150–1000 m elevation.

Phenology. *Aidia crassifolia* was observed in flower in February, with fruiting observed in February, August, and November.

IUCN Red List category. With GIS mapping of specimen localities (see specimen citations and distribution map at <www.tropicos.org/name/50322856>), we calculate an extent of occurrence (EOO) of 90.7 km² and an area of occupancy (AOO) of just under 20 km² using a cell size of 3.16 km. Using IUCN Red List Categories and Criteria Version 3.1 (IUCN, 2001), with an EOO of < 5000 km², an AOO of < 500 km², not more than five locations, and a continuing decline in extent and quality of habitat due to tree cutting and forest conversion to agriculture at least in the Uluguru lowlands of Milawilila Forest Reserve, we assign this species the IUCN Red List Category of Endangered, EN B1ab(iii)+2ab(iii).

Discussion. The specific epithet of the new species refers to its leaf texture, which is significantly thicker than that of the other East African species. It can also be distinguished from the other species of *Aidia* in East Africa by the other characters indicated in the key.

Paratypes. TANZANIA. **Tanga Region:** Korogwe Distr., Ambangulu Tea Estate, N of Ambangulu Tea Factory, E of rd. to Makweli and Mlalo villages, montane forest patch betw. Tea Plantation on steep slope facing NW, 05°03'50"S, 38°26'07"E, 1000 m, 8 Nov. 1998 (fr.), *C. J. Kayombo* & *M. A. Mwangoka* 1456 (K, MO). **Morogoro Region:** Morogoro Rural Distr., Milawilila Forest Reserve, 06°59'S, 37°45'E, 150 m, 21 Aug. 2000 (fr.), *E. B. Mhoro* UMBCP 374 (C, DSM, K, MO).

POLYSPHAERIA

Polysphaeria Hook. f. (Rubiaceae, Octotropideae; Robbrecht, 1993) is a genus of 20 species of shrubs and small trees of Africa, Madagascar, and the Comoro Islands (Verdcourt, 1980; Govaerts et al., 2009). It is distinguished by interpetiolar stipules not fused around the stem, congested-cymose to glomerulate inflorescences with well-developed bracts and bracteoles produced in both axils of leaf-bearing nodes, hermaphroditic 4- or 5-merous flowers, corolla lobes convolute in bud, anthers dorsifixed below

middle on very short filaments, 2-locular ovaries with the ovules solitary and pendulous on apical placentas in each locule, baccate fruits with one or two seeds, and a conspicuously ruminant endosperm. The bracts and bracteoles of the inflorescence are well developed and numerous, and enclose individual flowers and also groups of flowers.

Verdcourt (1988b) reported seven species of *Polysphaeria* from Tanzania and Kenya, plus *Polysphaeria* sp. A and *Polysphaeria* sp. B, which were incompletely known and could not be named or fully described there. Recent botanical exploration has documented the second of these putative species, which is newly described below.

1. *Polysphaeria ntemii* S. E. Dawson & Gereau, sp. nov. TYPE: Tanzania. Tanga Region: Muheza Distr., Maramba Division, Kwamtili Cocoa Plantation, Kwamngumi Forest Reserve, 4°57'00"S, 38°43'40"E, 150 m, 4 Nov. 1999 (fl., fr.), *A. Ntemi Sallu* & *C. J. Kayombo* 347 (holotype, K; isotypes, BR, M, MO, NHT, UPS). Figure 3.

Haec species quoad folia satis grandia venis secundariis 7- ad 11-jugatis, bracteas bracteolasque extus pubescentes et fructum 1–1.4 cm longum *Polysphaeriae macranthae* Brenan similis, sed ab ea habitu fruticis arbusculaeve usque ad 3 m altae, inflorescentia 10- ad 30-flora atque praecipue calyce corollaque multo minoribus distinguitur.

Treelet or shrub 1.5–3 m tall, DBH not recorded; red resin or sap visible in many organs as fine dots on surface giving speckled appearance; lateral branches arising from main stem above nodes, straight, terete, 2–5 mm diam., glabrous; young shoots somewhat shining, smooth, with bark light brown to pale gray, flaky when mature; internodes 1.2–9.5 cm. Stipules connate at base, triangular, keeled, ca. 5 × 5 mm, outer surface smooth, inner surface with thick colleters, falling to leave a pale corky scar with thick colleters and pale trichomes at base, apex aristate, ca. 0.9 mm, smooth, drying black, margins pale, chartaceous, ciliate; petiole 5–10 × 1.2–2 mm, laterally impressed and channeled, rough at base, articulated, drying dark brown, glabrous; leaf lamina oblong, ovate-oblong, or elliptic, 9–19 × 4.5–8.6 cm, sometimes those below lateral branches or at lower nodes broadly ovate and 2.7–3 × 2–3.6 cm, thinly coriaceous, drying gray-brown to gray-green, dull or with a slight sheen on both surfaces, glabrous, apex acuminate with acumen sometimes slightly emarginate, base obtuse to broadly cuneate to more usually rounded or truncate; midrib depressed adaxially; venation weakly brochidodromous with secondary veins 7 to 11 pairs, ascending at angle of 60°–75°, evenly spaced, joining to form looped submarginal

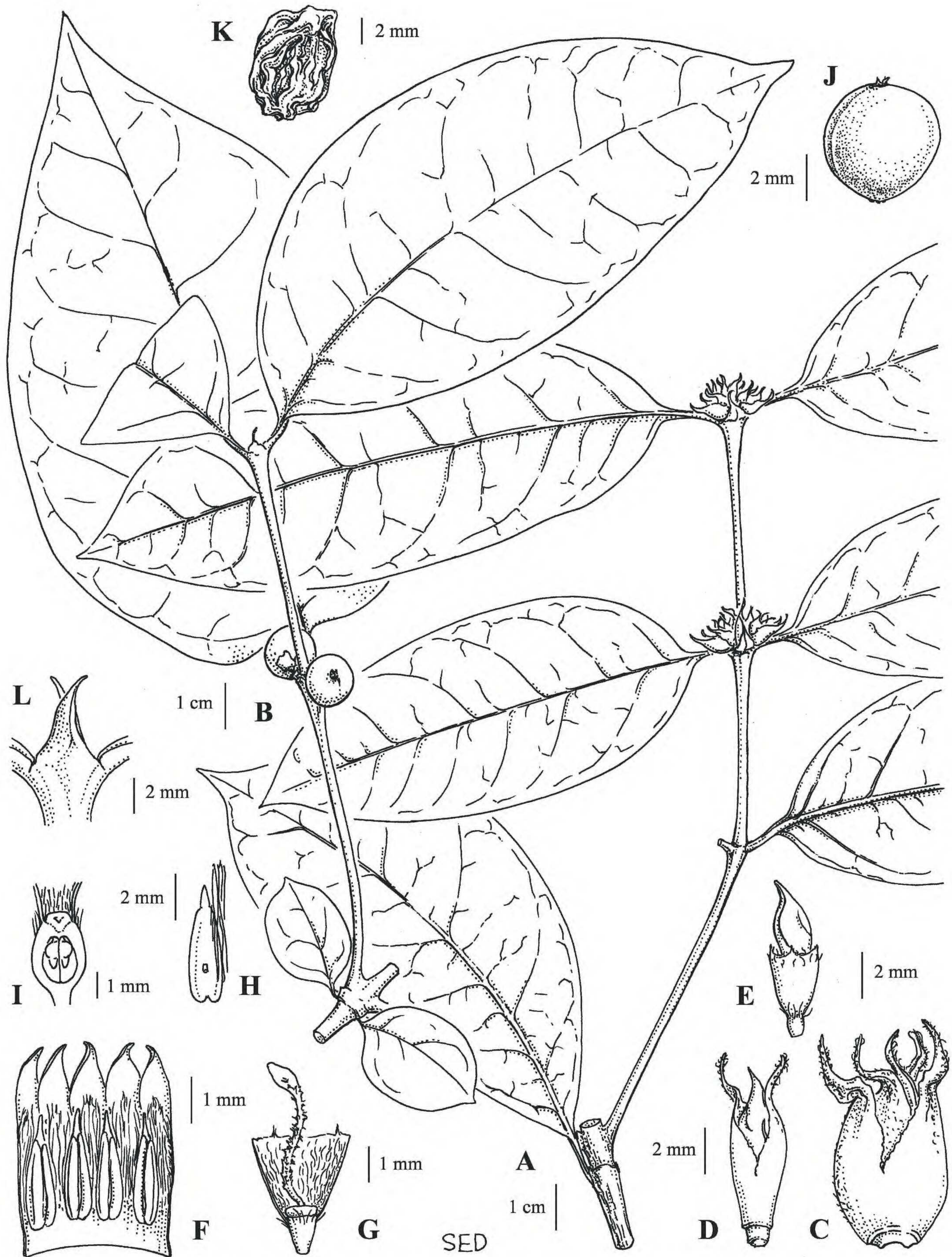


Figure 3. *Polysphaeria ntemii* S. E. Dawson & Gereau. —A. Flowering branch. —B. Fruiting branch. —C. Bracteoles surrounding bud. —D. Bracteole and bud. —E. Intact bud. —F. Bud dissected open. —G. Calyx and style. —H. Anther and trichomes, dorsal view. —I. Ovary, longitudinal section. —J. Fruit. —K. Seed. —L. Stipule. A from M. A. Mwangoka & A. Maingo 1281 (K); B, K, L from A. Peter 25237 (K); C–J from A. Ntemi Sallu & C. J. Kayombo 347 (K).

vein 2–5 mm from margin; tertiary and higher-order veins visible on both surfaces; domatia lacking. Inflorescence congested, glomerulate, 10- to 30-flowered, 9–11 × 7–10 mm, with flowers in triads, each flower surrounded by 2 bracteoles one within the other splitting from apex by enlargement of flower bud; bracts and bracteoles 4–9 mm, conical in bud, apex extended into 2(or 3) aristate lobes 0.7–2 mm, chartaceous, fragile and often broken on dried specimens, ferruginous, outer surface with scattered pale trichomes, particularly pubescent on lobes, inner surface covered with long pale trichomes growing toward apex, both surfaces with dark trichomes and sometimes thick colleters along upper margin, line of attachment at base pale and corky; pedicels ca. 0.3 mm, glabrous. Flower with hypanthium turbinate, ca. 3.5 × 0.8 mm, black-brown, with pale trichomes around base and apex; calyx limb cupular, 2–2.2 × ca. 2 mm, chartaceous, ferruginous, with few scattered trichomes outside, inner surface covered by white trichomes 0.2–0.4 mm growing toward apex, lobes 0.1–0.3 mm, triangular, pubescent and translucent at margin, becoming distinctly lobed and thickened as fruit matures; corolla only seen in bud, 5–5.3 × ca. 1.5 mm, white, drying black, glabrous, tube slightly funnel-shaped, ca. 2.5 mm, glabrous outside, inside with a dense matted flattened band ca. 2.5 mm wide of ferruginous trichomes 0.4–2.5 mm long at throat adhering to each anther connective, lobes forming a slender point in bud, 2–2.2 × ca. 1 mm, margins chartaceous; filaments ca. 0.1 mm, inserted at base of corolla lobes; anthers 2.2–2.5 mm, thecae 0.8–2 mm, sterile apex 0.3–0.4 mm; ovary disk a raised ring; style exerted, ca. 2 cm, covered with matted, flattened, ferruginous trichomes ca. 0.1 mm inside bud, glabrescent and exerted when mature; stigmatic lobes ca. 2 mm. *Fruit* subglobose, 1–1.4 cm long and in diam., red when fresh, brown when dry, dull, with a few trichomes on remains of calyx; seeds 2, plano-convex to hemispherical, 7–8 mm diam., brown when dry, sulcate, strongly striate.

Distribution and habitat. *Polysphaeria ntemii* is known from the East Usambara lowlands of Tanzania in evergreen lowland dry to moist forest, at 100–320 m elevation.

Phenology. *Polysphaeria ntemii* was observed in flower in November, with fruiting observed from July to November.

IUCN Red List category. With post facto georeferencing of historic specimens (*Peter* 25227, 25237) and GIS mapping of specimen localities (see specimen citations and distribution map at <<http://www.tropicos.org/name/100351324>>), we calculate an extent of

occurrence (EOO) of < 80 km² and an area of occupancy (AOO) of just under 50 km² using a cell size of 3.16 km. Using IUCN Red List Categories and Criteria Version 3.1 (IUCN, 2001), with an EOO of < 5000 km², an AOO of < 500 km², not more than five locations, and a continuing decline in extent and quality of habitat due to tree cutting and forest conversion to agriculture in the East Usambara lowlands, we assign this species the IUCN Red List Category of Endangered, EN B1ab(iii)+2ab(iii).

Discussion. This new species corresponds to “*Polysphaeria* sp. B” of Verdcourt (1980: 115, 1988b: 578) and Iversen (1991: 207). In his key, Verdcourt (1988b: 570) distinguished it from *P. macrantha* Brenan by its smaller calyx and corolla. The specific epithet honors the collector of the type, Albert Ntemi Sallu, who was employed at the time by the East Usambara Catchment Forest Project. *Polysphaeria ntemii* and *P. macrantha* are similar in having relatively large leaves with seven to 11 secondary veins, bracts and bracteoles pubescent outside, and large fruits (for *Polysphaeria*) 1–1.4 cm long. However, *P. macrantha* differs from the new species in being a larger tree to 10 m high, its small, 2- to 4-flowered inflorescences, and especially in its much larger calyx with limb 7–13 mm long and corolla with tube 10–11 mm long and lobes about 12 mm long. Furthermore, *P. macrantha* is a species of moist lower to middle montane forest at altitudes of 910–2105 m in the Eastern Arc Mountains (South Pare, East Usambara, and Udzungwa; see specimen citations at <www.tropicos.org/name/27909164>), while *P. ntemii* is confined to the East Usambara lowlands.

Paratypes. TANZANIA. **Tanga Region:** Muheza Distr., Kwamtili, 300 m, 3 Oct. 1918 (fr.), *A. Peter* 25227 (K, MO), 25237 (K); Mtai Forest Reserve, 4 Sep. 1996 (fr.), *Kisena* 1633 (K, TFD); Kwemnyese public forest patch (Kwamtili), in Kuze Kibago Village, 4°54'52"S, 38°43'34"E, 100 m, 24 May 2000 (young fr.), *M. A. Mwangoka* & *A. Maingo* 1281 (BR, K, MO, NHT, UPS); Kwamngumi W., 4°56'S, 38°45'E, 24 July 2001 (fr.), *W. R. Q. Luke*, *I. Rajabu*, *S. Chidzinga*, *C. Muir* & *B. Lyte* 7521 (EA, K, NHT, Ukunda); Misozwe Village, Mlinga Forest Reserve, dry lowland forest, 05°04'S, 38°47'E, 320 m, 18 Oct. 2001 (fr.), *A. Ntemi Sallu* 795 (BR, K, MO, NHT, RAB, UPS).

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